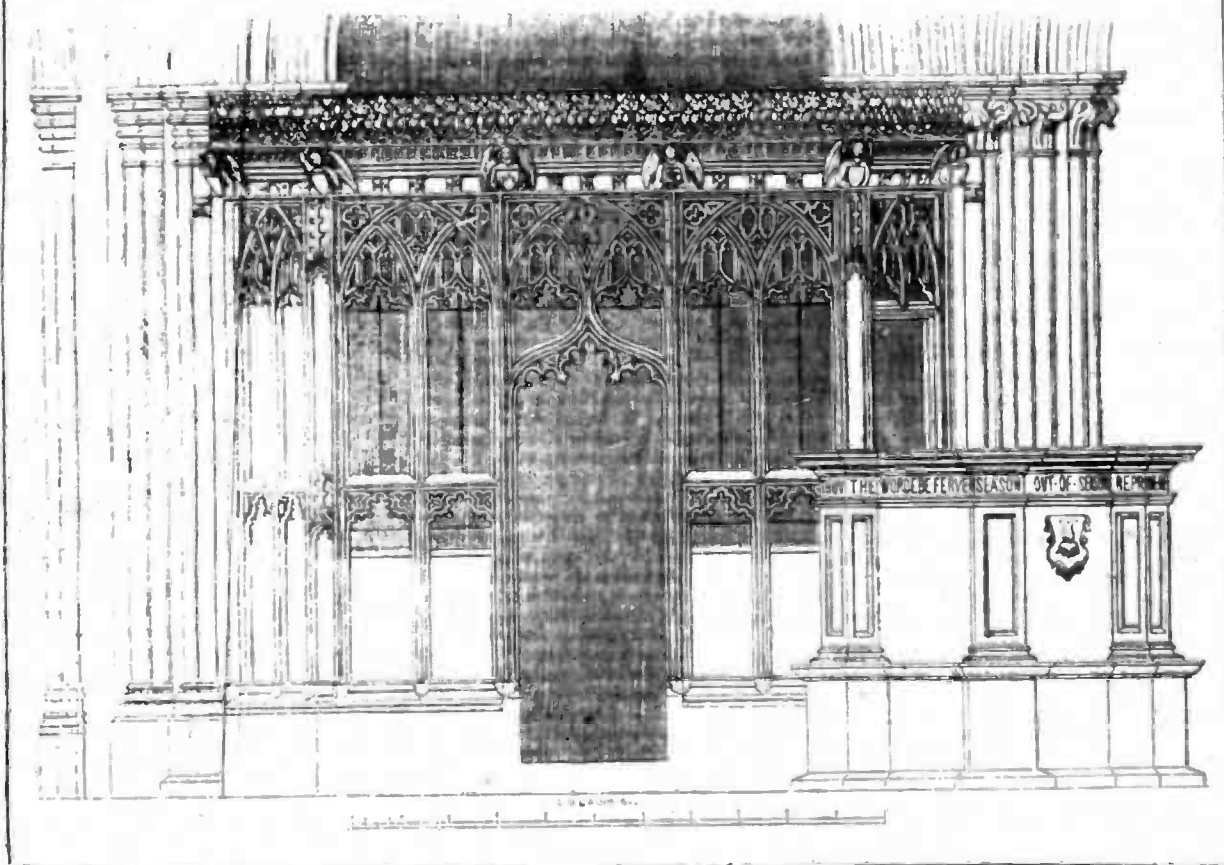


SUGAR'S CHANTRY.—WELLS CATHEDRAL.



SUGAR'S CHANTRY, WELLS CATHEDRAL.

On the north and south sides of the nave in Wells Cathedral, under the second arches from the transept, are two of those remarkable structures formerly erected and endowed for the purpose of prayer for the soul of the departed. These chantry chapels were essentially distinct edifices, and are to be found in many of our cathedrals, being generally of much later date than the building, in which they are inclosed. The chapel on the north side of the nave at Wells was erected by Bishop Bubwith, who was interred there in 1424. It is an elegant structure, richly decorated.

The chapel immediately opposite to this, of which we now give a beautiful illustration, is by some called Bishop Beckington's, and by others Bishop Knight's, but inaccurately as to both; for Bishop Godwin "expressly states, that it was erected by Hugh Sugar, I.L.D., treasurer of Wells (who was one of Beckington's executors), entirely of freestone, in place of a chapel of wood that previously stood there." This, like Bubwith's, is a hexangular structure, and not dissimilar in its general design; but the tracery of the upper division is more elaborate, and the frieze and crowning ornaments more richly sculptured; the east end, or altar part of the interior, is likewise far more sumptuously profuse in its sculptural decorations than that chapel. Attached to the frieze, both on the north and south, are six demi-angels bearing shields, charged, among other bearings, with the symbols of the five wounds; a cypher or monogram of the builder's initials, viz. H. S., his arms viz., three sugar loaves, surmounted by a doctor's cap! The same cypher and arms are repeated on shields, within quatrefoils and circles, under the canopy in the interior. The eastern façade, above where the altar stood, displays a most elegant series of five niches, separated by clustered buttresses, and crowned by highly enriched turreted

canopies, the soffits of which are elegantly groined in divers forms; the pedestals, which are wrought in a corresponding manner, are adorned with foliage. All the eastern part from the doorways is surmounted by a most splendid canopy or vault of stone, overspread with fan-like tracery, a rich central pendant, quatrefoils in circles, and a profusion of other forms and ornaments.

"Adjoining to the above chapel, against the great column, on the western side, is a *Stone Pulpit*, erected in Henry the Eighth's reign by Bishop Knight, who died in 1547; and which, says Godwin, 'he caused to be built for his tomb.' It consists of a basement, and a superstructure, fronted with pilasters, panelled, surmounted by an entablature; on the frieze of which is the following inscription in Roman Capitals:—*PREACHE THOU THE WORDS. BE FERVENT IN SEASON AND OUT OF SEASON. REPROVE, REBUKE, EXHORT, IN ALL LONG SUFFERING & DOCTRINE. 2 TIMO. In front are the Bishop's arms.*" Our engraving shews the principal front of the monument, with the pulpit attached. We shall next week give the plan and section, so as to illustrate completely this elegant little structure.

CONSTRUCTION OF BRIDGES.

Sir,—It is my intention in this paper to consider geometrically the principles of the arch, and to lay before the reader its construction, so that he may be enabled to form some idea of the cause of the many repeated failures that have lately occurred.

The arch stones 1, 2, 3, &c., fig. 1, of a bridge, are termed the *voussoirs*. The planes *ab*, *cd*, &c., the *bed-joints*, the exterior surface of the arch is the *extrados*, and the interior surface is called the *intrados*.

Now the arch, fig. 1, may be destroyed in two ways, first it may yield from the *voussoirs* sliding on each other; and secondly, the *voussoirs* may turn round on some point or points at which the bed-joint intersects the *extrados*

or *intrados*. We will proceed to shew the conditions of safety on these suppositions, which may be stated in words as follows:—

1. That in no part of the arch must the line representing the line of pressure form an angle with either of the bed-joints less than the complement of the angle of sliding, that is than the complement of the angle at which the *voussoirs* would begin to slide upon themselves.

2. That the line of pressure in the arch must be confined within the surfaces which bound the upper and under sides of the arch.

Let *AF*, *BH*, *CI*, fig. 2, &c., be a polygonal frame composed of pieces void of weight, and supported by leaning against each other at the planes *AE*, *BF*, *CH*, &c. Draw these planes or bed joints at right angles to the direction of the abutting pieces; that is, make *AE* perpendicular to *BA*; *BF*, perpendicular to *CB* &c. Let weights be placed at the points at which the bed-joints intersect the exterior surface of the polygonal frame. Then on the conditions which involve the stability of friction; let us first suppose the pieces would slide on each other at the bed-joints by the application of the slightest force, which of course supposed the material incapable of resistance from friction, and therefore all forces in the frame must be applied in the direction of the pieces or at right angles to the bed-joints. From *a* (1), draw the line *ab*, and erect the indefinite perpendicular *de*, parallel to the pieces *AB*, *BC*, *CD*, draw the lines *ae*, *ad*, *ac*, then will the lines, included within the triangle *ade*, represent the forces in the frame when it is in equilibrium, that is

de will represent the weight to be placed at 1.
ed ditto ditto ditto *H*:
de ditto ditto ditto *E*.

similarly also, and in the same proportion,

ab will represent the pressure on *DI* to which it is perpendicular.

ac ditto ditto *CH* ditto.
ad ditto ditto *BF* ditto.
ae ditto ditto *AE* ditto.

The same observation will apply to the other half of the polygonal frame, and if the whole

* Hugo Sugar, Arc. legum Doctor, qui Capellam elegantem ex polito lapide et sumptibus constructam, magno pulpito coenaculum, ubi lori lignea jam olim fuerat posita. De Præbendis, p. 341. The great pulpit here mentioned was built by Bishop Knight, seventy or eighty years subsequently to the erection of the chapel.

* Bolton's Wells Cathedral.